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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/557,838	09/25/2006	Philippe Desbois	12810-00166-US1	6753
23416 7590 03/28/2007 CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899			EXAMINER TESKIN, FRED M	
			ART UNIT 1713	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE			MAIL DATE	DELIVERY MODE
3 MONTHS			03/28/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/557,838	<b>Applicant(s)</b> DESBOIS ET AL.	
	<b>Examiner</b> Fred M. Teskin	<b>Art Unit</b> 1713	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-20 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>20051121</u> . | 6) <input type="checkbox"/> Other: ____  |

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The preliminary amendment of November 21, 2005, having been entered, claims 1-20 are currently pending and under examination.

Claims 9-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More specifically, the following grounds for indefiniteness apply to the indicated claims.

(A) Claim 9 provides the limitation to "the polyoxirane block A" (see line 2). There is no proper and sufficient antecedent basis for this limitation in the claim (i.e., claim 9 as amended to depend directly from claim 1).

(B) The expression "homopolymer ...*obtainable* by ..." renders claim 10 (and claims dependent thereon) indefinite because almost any variation in any parameter within the scope of the claimed process would alter the polymer produced. In consequence, one who made or used a polymer made by a process other than the process recited in claim 1 would have to produce polymers using all possible parameters within the scope of the claim – a practical impossibility – and then extensively analyze each product to determine if his product was *obtainable* by a process within the claimed process. A claim is indefinite if undue experimentation is involved to determine the boundaries of protection. *Ex parte Tanksley*, 26 USPQ2d 1389. This rationale is applicable to the present case in view of the extensive testing that would be involved in ascertaining whether a polymer made by a process different to

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that claimed is nevertheless obtainable by the claimed process. Amending claim 10 by replacing "obtainable" with –obtained- would obviate this ground of rejection.

(C) Claim 12 refers to "the homopolymers ... as claimed in claim 11", but claim 11 is specific to "a copolymer". These claims thus appear mutually inconsistent.

(D) Claim 13 also is inconsistent with claim 11, in view of the recital of "the homopolymers ... as claimed in claim ... 11".

(E) Claim 12 provides for the use of "the homopolymers or copolymers as claimed in claim 11", but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 12 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 8-10 and 14-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 3522194 to Hada et al.

Hada et al disclose a process for preparing homopolymers and copolymers of three membered cyclic ethers such as alkylene oxides and substituted alkylene oxides, using a catalyst composition prepared from an organoaluminum compound, including complexes obtained by reacting a compound selected from aluminum alkyls, aluminum alkyl halides and aluminum hydrides with a complexing agent of formula  $MY_m$ , wherein M is a metal of either Group I or Group II of the Periodic Table, Y is either *hydrogen*, fluorine, bromine or iodine and m is the valence of metal M. See column 1, ll. 45+ and column 2, ll. 2-6. Moreover, concrete examples are presented wherein epichlorohydrin is polymerized in the presence of triisobutylaluminum and potassium chloride or sodium fluoride, each used at a mole ratio within claim 6, viz., 1/1. See Examples 35-36 in column 6, which substitute the noted organoaluminum compounds for triisobutylaluminum in Example 1. Polymerization of epichlorohydrin as per Example 1 occurs without affirmative addition of either crown ethers or cryptands during the polymerization.

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Thus, Hada et al utilize species of "alkali metal compound" within claim 1 together with a trialkylaluminum compound within claims 1, 5, 18 and 19, at a molar ratio within claims 6, 9 and 20, to polymerize epichlorohydrin, which is considered an "oxirane" in view of the epoxy ring included in its structure. Based on the identity of polymerization conditions, the polymer preparation detailed in Examples 35-36 is reasonably presumed to occur *via* anionic polymerization as per claim 1.

Alternatively, even if the claim term "oxiranes" is narrowly construed to the simplest of epoxides such ethylene and propylene oxide, note that these are named in Hada et al as examples of three membered cyclic ethers polymerizable by the patentees' process (see col. 3, ll. 10+). Substitution of ethylene oxide or propylene oxide for epichlorohydrin in Example 35 or 36 of Hada et al would have been obvious to one of ordinary skill in the art at the time of applicants' invention, motivated by the expectation of obtaining a polyether displaying a comparable increase in molecular weight, consistent with the stated aim of Hada et al (i.e., obtention of high molecular weight polyethers; see col. 1, ll. 31-35). Such a homopolymer and polymerization process are embraced by claims 3, 8-10, 14 and 17, as none of these claims are positively limited to preparing block copolymers or to sequential polymerization.

As to claims 4, 15 and 16, these claims each embrace use of an alkali metal hydride as the alkali metal compound of the claimed invention. While illustrating epichlorohydrin polymerization in the presence of a trialkylaluminum compound (triisobutylaluminum) and potassium chloride or sodium fluoride, Hada et al generically teach the same utility for complexes obtained by reacting an organoaluminum

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compound with a complexing agent of formula  $MY_m$ , wherein M is a metal of either Group I or Group II of the Periodic Table, Y is either *hydrogen*, fluorine, bromine or iodine and m is the valence of metal M (col. 2, ll. 2-6).

Given their proposed interchangeability, there would have been a reasonable expectation of Group I (alkali metal) hydrides performing equivalently to the corresponding halides in the polymerization of Hada et al. It would, therefore, have been obvious to an ordinarily skilled practitioner at the time of applicants' invention to modify the reference by utilizing in lieu of potassium chloride or sodium fluoride in the noted examples of Hada et al, an equivalent ratio of an alkali metal hydride such as potassium or sodium hydride, motivated by the expectation of achieving comparable polymerization performance. This is especially so in the absence of evidence of criticality in the alkali metal hydride, vis-à-vis the corresponding alkali metal halides exemplified in Hada et al.

Claims 10-13 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over any one of applicants' Cite No. CE, US 3644244 (Hani et al) and US 3580866 (Ito et al).

Reference CE discloses anionically polymerized polystyrene-polyethylene oxide di-block copolymers characterized by number-average molecular weights ( $M_n$ ) as high as 19,000 g/mol and a corresponding molecular weight distribution ( $M_w/M_n$ ) of 1.09 (see page 6, Table 2, Run 9). Block copolymers of oxiranes and styrene comonomer

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obtainable by the applicants' process can possess similar molecular weight parameters; e.g.,  $M_n$  of 19,400 and PDI of 1.5 (*cf.*, Specification Examples C1 and C3).

Hani et al disclose a catalyst for polymerizing epoxides to attain a high conversion rate as well as polymer products having varied properties from amorphous rubber-like polymers to crystalline polymers (col. 1, ll. 58+). Epichlorohydrin polymer characterized by high crystallinity is obtained at quantitative conversion in Example 12 (col. 6). The crystalline product is said to be useful in forming the same article types as recited in claims 12 and 13, e.g., fibers (see col. 4, lines 40-41).

Ito et al disclose high molecular polymers of alkylene oxides, the degree of polymerization being reflected by intrinsic viscosity measurement (col. 1, ll. 45+ and col. 2, ll. 17-20). Polymerization of ethylene oxide to polymers having intrinsic viscosities of 18.5, 19.7, 24.1 and 22.4 is illustrated (see Table 8).

Although the applied references prepare alkylene oxide homo- or co-polymer by polymerization procedures different to the process of the present invention, the similarity in molecular weight characteristics and polymer composition provide a plausible basis for concluding that the instantly claimed products and use are the same as, or unobviously different from, those of the prior art.

Where, as here, product-by-process claims are rejected over prior art products that appears to be identical, although produced by a different process, the burden properly shifts to applicants to come forward with evidence establishing an unobvious difference between the claimed products and the prior art products. *In re Marosi*, 218 USPQ 195 (Fed. Cir. 1983). This is especially true given the lesser burden of proof on

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the Office in making out a case of *prima facie* obviousness for product-by-process claims, because of their peculiar nature (M.P.E.P. 2113).


Claim 7 is objected to as being dependent on a rejected base claim but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim.

Any inquiry concerning this communication should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FMTeskin/03-21-07

  
**FRED TESKIN**  
**PRIMARY EXAMINER**  
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